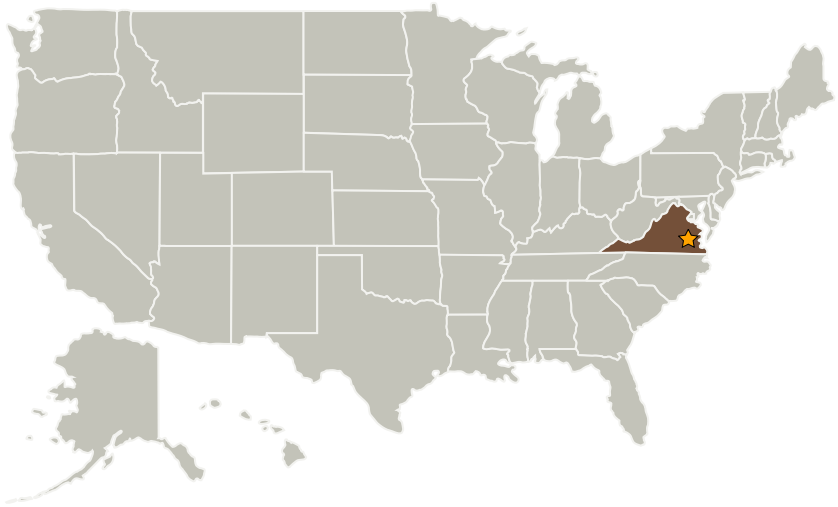
Real Time Monitoring and Test Vector Generation for Improved Flight Safety, Phase II

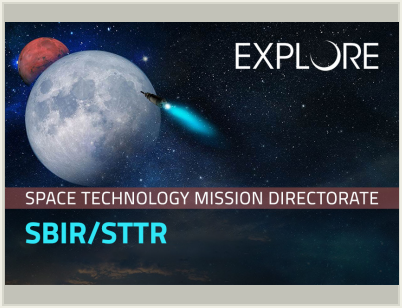
Completed Technology Project (2005 - 2007)

Project Introduction

As the complexity of flight controllers grows so does the cost associated with verification and validation (V&V). Current-generation controllers are reaching levels of complexity that push the envelopes of existing V&V approaches, and further increases in controller complexity are required to provide the operational capabilities desired for next generation systems. Without improved approaches, there is little hope for affordable V&V of next-generation intelligent systems and, unfortunately, controller validation is required to ensure the safety of these systems. Barron Associates proposes an aggressive plan of research to develop monitoring algorithms that estimate, in real time, safety margins of complex feedback systems based on observed differences between the model used for controller development and actual flight data. The Phase II research will focus on the flight test environment where these algorithms will allow the flight test engineer to monitor and revise the test plan in real time - accelerating the test-matrix buildup when safety is assured and avoiding test points where safety is questionable. The tool will also recommend test points that could help refine safety margin estimates for as yet unexecuted maneuvers. The result will be reduced flight test costs and improved safety.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Langley Research Center (LaRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Langley Research Center(LaRC)	Lead Organization	NASA Center	Hampton, Virginia
Barron Associates, Inc.	Supporting Organization	Industry	Charlottesville, Virginia

Primary U.S. Work Locations
Virginia

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.4 Environmental Monitoring, Safety, and Emergency Response
    - TX06.4.2 Fire: Detection, Suppression, and Recovery